

Environmental Restoration

Deactivation and Decommissioning

U.S. Department of Energy (DOE) scientists and engineers are managing and disposing of process-contaminated buildings and facilities as part of a national commitment to clean up sites contaminated from past activities. This program is called facility deactivation and decommissioning. The Nevada Test Site (NTS) is one of the locations targeted for this project. The program is being conducted by the DOE Nevada Operations Office (DOE/NV), Environmental Restoration

- Known or suspected to be contaminated with radiological or mixed wastes.

The deactivation and decommissioning program at the NTS involves the following three steps:

Characterization

Scientists and engineers collect information about the facility and the type and extent of the contamination. Process knowledge (knowing what processes took place that contaminated the facility) is critical in preparing and implementing the plan. To enhance process knowledge, physical, chemical, and radiological sampling and analyses are performed to learn more about potential contamination.

Design

The design stage is used to identify and solve technical problems, choose appropriate clean-up methods, and decide what techniques are necessary to achieve goals. Work plans are developed using the information collected during facility characterization. The results of the design stage are provided in a detailed plan that includes the implementation process.

Remediation

This step in the process involves the actual deactivation and decommissioning of the facility. There are several ways to secure or dispose of a building. They include: demolition, dismantlement, entombment, administrative controls, or a combination of these techniques. Once the work is completed, verification surveys are performed and a final report by a verification contractor is completed as certification. Facilities awaiting deactivation and decommissioning receive the required DOE maintenance to minimize environmental and public exposure to contaminants.

What Facilities Will Be Evaluated?

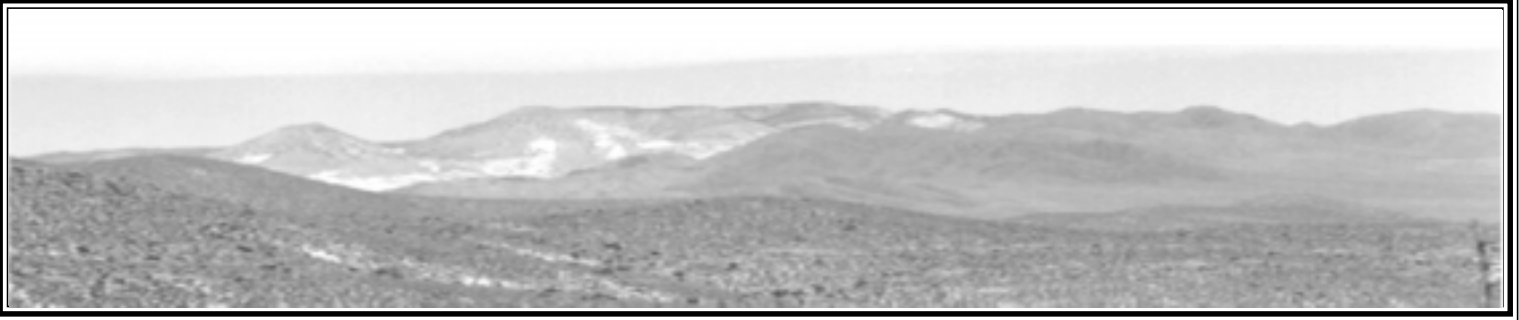
The DOE/NV has evaluated eight facilities at the NTS as part of the deactivation and decommissioning program. Two of these facilities, the Jr. Hot Cell and the Environmental Protection Agency (EPA) Farm, have already been decommissioned. Six other facilities have recently been analyzed: the Pluto Facility, the Super Kukla Facility, the Reactor-Maintenance and Disassembly Facility (R-MAD), the Engine-Maintenance and Disassembly Facility (E-MAD), Test Cell A, and Test Cell C. Based on the results of the analysis,



Division. Deactivation is the process of placing a facility in a stable and known condition including the removal of hazardous and radioactive materials to ensure adequate protection of the worker, public health and safety, and the environment, thereby limiting the long-term cost of surveillance and maintenance. Decommissioning takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement. These actions are taken at the end of the life of a facility to retire it from government service and possibly prepare it for reuse by the private sector.

Facilities are considered for the deactivation and decommissioning program if they are:

- No longer being used, have no planned future use, or could be re-industrialized.



Facilities constructed to support these programs included:

- ***Reactor-Maintenance and Disassembly (R-MAD) Facility***

Consisting of one primary multi-story structure of reinforced concrete construction that totals 30,442 square feet.



R-MAD Facility: scheduled for decontamination and eventual demolition.

- ***Engine-Maintenance and Disassembly (E-MAD) Facility***

Consisting of one primary structure of reinforced concrete construction that totals 69,750 square feet.



E-MAD Facility: Hot Cell characterization completed in 1996; scheduled for reuse.

- ***Test Cell A***

Consisting of one primary structure of reinforced concrete construction that totals 980 square feet.



Test Cell A: scheduled for decontamination and eventual demolition.

- ***Test Cell C***

Consisting of one primary structure of reinforced concrete construction with steel piping that totals 12,186 square feet.



Test Cell C: scheduled for decontamination and eventual demolition.



the Pluto Facility and the E-MAD Facility have been determined to be suitable for reuse and will undergo further analysis to determine whether any additional remediation is needed. The four remaining facilities still contain materials that are hazardous or radioactive and will undergo decontamination and eventual demolition. The extent of contamination and the size of the building or facility determine the time it takes to evaluate and conduct decommissioning activities at each site. Structures within these facilities range in size from small to very large (nearly 70,000 square feet). Since the process includes many stages, one facility might be undergoing historic review while another is in the final stages of decommissioning. The decommissioning of these four sites will be completed by 2006. A brief description of the eight facilities in the program follows.

Project Pluto

The objective of Project Pluto was to develop a reactor for a nuclear engine that would be capable of propelling a supersonic aircraft for an extended distance and time period. Under this program, the 12,500-square-foot Pluto Maintenance and Disassembly Building was built and used for the following activities: engine assembly, component replacement, and complete disassembly of the nuclear engine for maintenance and postmortem investigations. Sections of the concrete-block facility were radiologically contaminated during these operations from 1961 to 1970. Since its closure in 1970, some clean-up activities were conducted. The Project Pluto area will be further characterized to determine if further remediation is necessary to close the site.



Pluto Facility: scheduled for reuse.

Super Kukla Facility

Scientists built a special nuclear reactor at the Super Kukla Facility to conduct experiments on weapon components between 1964 and 1979. When the tests concluded in 1979, the reactor was shut down. All the nuclear fuel was removed to an off-site location. The research at the facility created radiological and hazardous material contamination, most of which was removed during the shut-down process. This reactor facility, totaling 640 square feet, will undergo further evaluation to determine remediation needed to comply with current environmental laws.



Super Kukla Facility: scheduled for decontamination and eventual demolition.

Project Rover (Nuclear Rocket Development Station)

Four facilities slated for decommissioning were used by scientists to research the use of nuclear reactors to power rocket engines. Full-sized nuclear rocket engines were constructed, tested, and disassembled as part of rocket program research activities. The rocket program began in 1955 and was cancelled in 1972. Research activities left portions of the facilities contaminated with radioactive and hazardous materials. Some cleanup of these materials was done when these buildings were closed. However, scientists will now study the facilities to decide the level of remaining contamination and provide direction for the appropriate deactivation and decommissioning of the now-idle Project Rover facilities.



- **Jr. Hot Cell**

This facility consisted of one 576-square foot metal building where radio-chemistry samples were once obtained and analyzed. Deactivation and decommissioning activities were completed in 1995.



Removal of North Wall, Jr. Hot Cell Facility, August 1995.



EPA Farm demolition by explosives, September 1997.

EPA Farm

At the request of the DOE and its predecessor agency, the Atomic Energy Commission, EPA operated a 36-acre experimental farm at the NTS from 1963 to 1981. Scientists at the EPA Farm primarily studied how milk and meat products would be affected if dairy and beef cows were fed plants contaminated with radioactivity. Researchers conducted additional studies on other domestic and wild animals, both on and off the NTS. Experts analyzed the three concrete, steel, and metal structures on the farm, which totaled 6,634 square feet, and determined the facility could be deactivated and demolished. Deactivation and decommissioning activities were completed in December 1997.

Summary

The U.S. Department of Energy has implemented a nationwide deactivation and decommissioning program which effectively manages and disposes of buildings and facilities that have been contaminated from DOE-related activities. The DOE Nevada Operations Office is actively involved in this program, having deactivated and decommissioned two facilities, while continuing work on six others. Although two additional facilities have been designated for reuse, the remaining four are being analyzed to determine the extent of additional cleanup necessary to comply with state and federal laws and regulations, as well as deactivation and decommissioning program guidelines.

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